

REMARKS

Favorable reconsideration and allowance of the present application in view of the foregoing amendments and following remarks are respectfully requested.

Currently, claims 1, 3, 9, 10, 12-15, 27-30, 34-36, 53-78 and 82-139 remain pending in the present application, including independent claims 1, 27, 82, 92, 103, 115 and 127.

In the previous Office Action, dependent claims 58-78 were indicated as being withdrawn from consideration as being directed to a non-elected species. Applicant respectfully requests reconsideration in that claims 58-78 are directed to dependent claims that are believed to be generic or consistent with the previous species election. Applicant also requests consideration of new claims 82-139.

In the Office Action, the claims were rejected over Dobson alone or in combination with Griner. In response, independent claim 1 has been amended to incorporate the limitations of claim 13, while independent claim 27 has been amended to incorporate the limitations of claim 36. Claims 1 and 27 are both directed to a process for heating semiconductor substrates in which light energy is contacted with the semiconductor substrate at an angle of incidence of greater than 0° as defined in claim 1 or greater than at least 10° as defined in claim 27. The light energy strikes the substrate in a p-polarization plane or near a p-polarization plane. Claim 27 specifically defines the light energy as being a laser beam.

As now amended, claims 1 and 27 further require the additional step of sensing the amount of light energy that is reflected off of the semiconductor substrate and, based on this information, changing the configuration of the light energy in order to change the amount of light energy absorbed by the semiconductor substrate. For instance, the angle of incidence, the wavelength, or the orientation of the light energy may be changed in order to, for instance, increase the amount of energy absorbed by the semiconductor substrate during processing.

In comparison, neither Dobson nor Griner disclose or suggest a process in which the amount of light energy reflected off of the semiconductor substrate is sensed and wherein this information is used to change the configuration of the light energy in order to change the amount of light energy being absorbed. For instance, Dobson does disclose using a reflection high energy electron diffraction arrangement for assessing surface conditions but nowhere discloses or suggests sensing the amount of light energy being reflected off of the substrate in order to change the light energy configuration.

Griner as shown in Figure 1A discloses the use of a concave mirror in order to direct reflected light back down onto the surface of the sample. Similar to Dobson, however, nowhere does Griner disclose or suggest a process in which the amount of light energy being reflected off of the substrate is sensed in order to change the light configuration. As such, it is believed that independent claims 1 and 27 patentably define over the two cited references.

The Examiner's attention is also directed to new independent claims 82, 92, 103, 115 and 127. Each of these claims are believed to contain limitations not present within the cited prior art. For instance, claim 82 requires that the light energy being directed onto the semiconductor substrate be emitted from a laser diode. As stated in the specification, the use of a laser diode is believed to provide various advantages during certain processes to be conducted in the thermal processing chamber. The use of a laser diode is not disclosed or suggested in either Dobson or Griner.

Independent claim 92 is particularly directed to processing semiconductor substrates coated with polysilicon or silicon oxide. As shown in Figures 4 and 5 of the present application, various advantages are available when contacting a semiconductor substrate coated with polysilicon with light energy in accordance with the present invention.

Independent claim 103 is directed to processing semiconductor substrates having an irregular surface that comprise non-smooth features, such as described on

pages 6 and 7, for instance, of the present application. Independent claim 115 is particularly directed to an ion implantation anneal process in which the semiconductor substrate is heated to a temperature sufficient to cause repairs in defects present in the substrate. Finally, independent claim 127 is directed to processing a semiconductor substrate having a pattern of coatings present on a surface of the wafer. Claim 127 requires that the angle of incidence of the laser beam be adjusted so that the substrate is more uniformly irradiated.

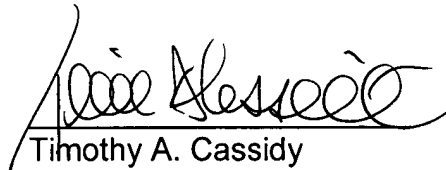
In summary, it is believed that the present application as currently amended is in complete condition for allowance. Favorable action, therefore, is respectfully requested. Should any issues remain after consideration of this response, however, then Examiner Fuqua is invited and encouraged to telephone the undersigned at her convenience.

Please charge any additional fees required by this Amendment to Deposit Account Number 04-1403.

Respectfully submitted,

June 29, 2004

Date


Timothy A. Cassidy
Reg. No: 38,024

DORITY & MANNING, P.A.
P.O. Box 1449
Greenville, SC 29602
(864) 271-1592
(864) 233-7342